

WHAT IS CLAIMED IS:

Sub
A2

1. A method of measuring the displacement of the optical axis of an optical microscope having an illumination optical system and a projection optical system, the method comprising:

5 a step of irradiating the evaluation mark having diffraction grating patterns formed on a substrate with illumination light by way of the illumination optical system and observing the evaluation mark by way of the projection optical system to obtain the brightness of the evaluation mark; and

10 a step of measuring the displacement of the optical axis on the basis of the relationship between the brightness of the image of the evaluation mark and the direction of the diffraction grating patterns of the evaluation mark.

15 2. The method of measuring the displacement of the optical axis according to claim 1, wherein the evaluation mark is composed of at least two gratings connected together and arranged in a series, each having parallel bars that extend in a direction different from those of any other grating.

20 3. The method of measuring the displacement of the optical axis according to claim 1, wherein normal light of the illumination light is blocked at the position of the pupil of the projection optical system.

4. The method of measuring the displacement of
the optical axis according to claim 2, wherein
diffracted light of the illumination light is
blocked at the position of the pupil of the projection
5 optical system.

5. The method of measuring the displacement of
the optical axis according to claim 1, wherein
a plurality of beams of diffracted light produced
by the diffraction grating patterns are blocked
10 asymmetrically at the position of the pupil of the
projection optical system relative to normal light of
the illumination light by the substrate.

6. The method of measuring the displacement of
the optical axis according to claim 2, wherein
a plurality of beams of diffracted light produced
15 by the diffraction grating patterns are blocked
asymmetrically at the position of the pupil of the
projection optical system relative to normal light of
the illumination light from the substrate.

20 7. The method of measuring the displacement of
the optical axis according to claim 1, wherein
diffracted light is generated by the diffraction
grating patterns with asymmetrically differentiated
intensity relative to normal light.

25 8. The method of measuring the displacement of
the optical axis according to claim 2, wherein
diffracted light is generated by the diffraction

grating patterns with asymmetrically differentiated intensity relative to normal light.

Sub A4

9. An optical microscope comprising:
an illumination optical system through which
illumination light to be applied to an evaluation mark
passes;

10 a projecting optical system through which the
illumination light reflected from the evaluation
passes; and

10 a removable and rotatable shield means provided at
a pupil of the projection optical system and having a
shield area, the shield area is arranged asymmetrically
relative to normal light of the illumination light from
the substrate.

15 10. The optical microscope according to claim 9,
wherein
the evaluation mark is formed on the substrate.

15 11. The optical microscope according to claim 9,
wherein
the evaluation mark is formed on the stage for
carrying the substrate.

20 12. An evaluation mark comprising:
a substrate; and
diffraction gratings formed on the substrate and
adapted to asymmetrically generate diffracted light
when irradiated with light.

25 13. The evaluation mark according to claim 12,

wherein

the diffraction gratings show a saw-blade like cross section.

14. The evaluation mark according to claim 12,

5 wherein

the diffraction gratings show a stepped cross section of a plurality of steps.